

Claims

1. Method for producing a fibre-reinforced sheet material made of a fibre web which is impregnated with a thermoplastic plastics material matrix, containing at least one planar fibre structure, characterised in that the fibre structure(s) are impregnated or coated with a reactive starting material containing cyclic or macrocyclic oligomers of the polyester, and the fibre web containing one or more impregnated or coated fibre structures brought together is coated on one or both sides with an outer layer containing a polymerised polyester, and the fibre web which is coated with the outer layer is pressed in a pressing device to form a sheet material, wherein the reactive starting material is polymerised into a plastics material matrix surrounding the fibre structures and permanently connected to the outer layer.
2. Method according to claim 1, wherein the reactive starting material contains cyclic oligomers of the PBT (CPBT) blended with a polymerisation catalyst.
3. Method according to either of claims 1 or 2, wherein the outer layer contains a PET, PBT or a PBT plastics material alloy, or consists thereof.
4. Method according to any one of claims 1 to 3, wherein the outer layer is applied to the fibre web in the form of a pure plastics material film.
5. Method according to any one of claims 1 to 3, wherein the outer layer is extruded onto the fibre web in a solid, partially solid or liquid form.
6. Method according to any one of claims 1 to 3, wherein the outer layer is applied to the fibre web as a fibre-reinforced, web-shaped plastics material with an outer, exposed and fibre-free plastics material layer made of a polyester, preferably a PET, PBT or a PBT blend.

7. Method according to any one of claims 1 to 6, wherein the sheet material is produced continuously and in line with the supply of web-shaped fibre structures.
- 5 8. Method according to any one of claims 1 to 7, wherein the fibre structure(s) of the fibre web are impregnated or coated in line with the reactive starting material or are supplied already preimpregnated or precoated to the equipment.
- 10 9. Method according to any one of claims 1 to 8, wherein the fibre structure(s) which are impregnated or coated with the reactive starting material are supplied continuously and in a web-shape and brought together to form a fibre web, and the fibre web is coated in line on one or both sides with an outer layer, preferably in the form of a film or an extruded film.
- 15 10. Method according to any one of claims 1 to 9, wherein the fibre web which is coated on one or both sides with an outer layer is pressed in line in a feed-through press to form a sheet material.
- 20 11. Method for producing a fibre-reinforced plastics material article containing a fibre structure embedded in a plastics material matrix made of a polyester, wherein the cavity of a moulding tool is equipped at least with a fibre structure and a reactive starting material containing cyclic or macrocyclic oligomers of the polyester blended with a polymerisation catalyst, and the
- 25 the moulding tool is closed and the reactive starting material is polymerised to form a thermoplastic plastics material matrix with the application of pressure and/or heat, characterised in that the wall of the tool cavity is coated with a film made of a reactive starting material containing cyclic or macrocyclic oligomers of the polyester or a polymerised polyester, such as
- 30 PET, PBT or a PBT blend.
12. Method for producing a multi-layer composite containing at least one layer made of a foamed material and an outer layer connected thereto made of a

- 5 fibre-reinforced sheet material, characterised in that both the foamed material and the sheet material contain a plastics material matrix made of a polyester and, to produce the multi-layer composite, a single-layer or multi-layer fibre web which is impregnated or coated with a reactive starting material containing cyclic or macrocyclic oligomers of the polyester blended with a polymerisation catalyst is connected to a foamed material layer made of a polymerised polyester to form a laminate, and the reactive starting material is polymerised, with formation of the plastics material matrix of the sheet material and with an intimate connection to the foamed material layer, to form a polyester.
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13. Method according to claim 12, wherein a starting material which is loaded with a blowing agent is extruded by means of an extruder on the impregnated or coated fibre web and is expanded with relief of pressure to form a foamed material layer, which is brought together with the impregnated or coated fibre web and is connected thereto.
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14. Method according to claim 13, wherein the starting material is extruded through a perforated plate in the form of individual strands which on discharge expand to form a foamed material and mutually adhere to form a foamed material layer.
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15. Method according to any one of claims 11 to 13, wherein the foamed material layer is coated on either side with a sheet material.
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16. Method for producing a multi-layer composite containing at least one layer made of a foamed material and an outer layer connected thereto made of a fibre-reinforced sheet material, characterised in that both the foamed material and the sheet material contain a plastics material matrix made of a polyester and, to produce the multi-layer composite, a starting material which is loaded with a blowing agent is extruded on the sheet material, which expands with relief of pressure to form a foamed material layer and is brought together with the sheet material to form a multi-layer composite.
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17. Method according to claim 16, wherein the starting material is extruded through a perforated plate in the form of individual strands, which, on discharge, expand to form a foamed material and mutually adhere to form a foamed material layer.
18. Method according to either of claims 16 or 17, wherein the foamed material layer is coated on either side with a sheet material.
19. Method for producing a fibre-reinforced plastics material article, characterised in that both the reinforcement fibres of the fibre structure and the plastics material matrix consist of a polyester, the polyester fibres being processed with directed crystallinity to form a fibre structure and the fibre structure being processed to form a fibre reinforced plastics material article forming a plastics material matrix, in that the surfaces of the fibres are melted and hardened with the formation of an isotropic plastics material matrix surrounding the non-molten part of the fibres.
20. Method according to claim 19, wherein the plastics material article is produced by a hot pressing method.